



**UNITED STATES DEPARTMENT OF COMMERCE**

**United States Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/252,514    02/18/99    NANDAKUMAR

M    TI-23103

023494    MMC1/0605  
TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS TX 75265

EXAMINER

CRANE, S

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

06/05/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trad marks**

**Office Action Summary**

Application No.

09/252,514

Applicant(s)

NANDAKUMAR ET AL.

Examiner

Sara W. Crane

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 April 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 and 3-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

See reasons of record in the Office action of 15 February 2001. As noted in that Office action, the specification does not teach any embodiment having the combination of features recited. Nor is any teaching provided which would motivate one of ordinary skill to select the combination of features recited. In particular, there is no teaching of a channel region having a second doped region underlying a first doped region, where the second doped region has a lower effective dopant concentration than the first doped region, and where the second doped region is the primary conduction channel.

Applicant points to the sentence bridging pages 5 and 6 of the specification for support, but this teaching does not correspond to the claim, because the sentence says that the surface may not be doped at all. If the surface layer is not doped at all, it will have the dopant type of the "semiconductor material," i.e., the "first conductivity type." But the "first doped region" is of "opposite conductivity type," i.e., opposite to the "first conductivity type." The specification does not teach anything at all about the relative

Art Unit: 2811

"effective" dopant concentrations of the two doped regions. The specification discusses counterdoping, which means merely that dopant of opposite conductivity type is introduced. If a small amount of counterdopant is introduced, this may reduce the "effective" dopant concentration relative to an undoped region, if the counterdopant is of opposite conductivity type to that of the undoped region. Or, if a large amount of counterdopant is introduced, this may increase the "effective" dopant concentration relative to an undoped region, even if the counterdopant is of opposite conductivity type to that of an undoped region. The specification simply does not address the question of the amount of counterdopant to be added to the respective channel regions as claimed, when ~~the subsurface layer is utilized as the~~ primary conduction channel.

Claims 1 and 3-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

See reasons of record. As noted in the previous Office action, there is no teaching provided to enable one of ordinary skill to make a device having a "primary conduction channel" with lower "effective" dopant concentration than an overlying channel.

Moreover, if the source and drain regions are the same conductivity type as the region of semiconductor material in which they are formed, current will flow from source to drain through the region of semiconductor material, shorting out any channel regions of opposite dopant type. There is no teaching provided that would enable one of

Art Unit: 2811

ordinary skill to avoid current flowing from source to drain through the doped wells. If the source, drain, and well are all of the same conductivity type, one would not have a transistor.


### ***Conclusion***

As noted above, there does not appear to be any teaching of a device having the specific combination of features recited, so this would be new matter. Also, if the source and drain are of the same conductivity type as the well, what would keep current from flowing through the well? How would one get the primary channel current to flow through an oppositely doped region, when the well itself would provide a path having lower resistance? There is an enablement problem as well as a new matter problem.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (703) 308-4894.

The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

  
Sara W. Crane  
Primary Examiner  
Art Unit 2811